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(74) Agent Yeong-Bok Choi

(72) Inventor U-Hyeon Baek
Bae-Geun Gang
Tae-Jun Park
Seung-Hwan Lee

(71) Applicant LG Electronics Inc. Ja-Hong Gu

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(54) BROADCASTING SERVICE SYSTEM BASED ON MOBILE NETWORK

Abstract

Machine Translation

1 The present invention relates to the broadcasting service system using the mobile radio communications network and the broadcasting service system which transmits the TV broadcasting signal based on the cellular phone or PCS, CDMA of the IMT-2000 mode, CDMA-2000 etc. for example, and in which a subscriber watches the transmitted TV broadcasting signal by using its own terminal. The present invention controls an image and speech signal of the television system to a format, a standard and the transfer rate which is suitable for the characteristic of the mobile radio communications network and it converts. It together converts into moreover, EPG information and additive service information with a format, a standard and transfer rate. In order to maintain the protocol which is suitable for the mobile radio communications network it processes. It transmits the digital image and the voice information which in this way, is processed with the allocated predetermined channel through the mobile radio communications network to a subscriber. It selects the channel which desires a watching by using EPG information a subscriber. It is the broadcasting service system using the mobile radio communications network which watches by being provided the broadcast information of the selected channel and using its own terminal.

Machine Translation Human Translation

PURPOSE: A broadcasting service system is provided to audition television broadcasting through a mobile telecommunication system by converting image and voice signals of the system into signals appropriate for a mobile telecommunication network.

CONSTITUTION: A broadcasting service system comprises a format converter(105) and a system controller and switch(MTSO)(108). The format converter(105) converts MPEG2 image resource from a television broadcasting system(101) into MPEG4(H.26L or H.26X) appropriate for a mobile telecommunication network. The format converter(105) exchanges various information required for the format conversion through a line(107). The converted information is provided to the MTSO(108), which supplies a signal for responding to a request from a subscriber to the format converter(105) through a line(110). The converted information is sent to a subscriber terminal(112) through a base station(111).

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Representative Drawing(s)

Fig. 1

Sword(s)

The TV broadcasting service system, the personal communications service, and the mobile communication.

Descritption

Brief explanation of the drawing

2 Fig. 1 is a drawing showing the summary configuration of the broadcasting service system using the mobile radio communications network of the present invention

3 Fig. 2 is a drawing showing the embodiment of the broadcasting service system using the mobile radio communications network of the present invention

4 Fig. 3 is a drawing showing the embodiment of the format convertor in the present invention

5 Fig. 4 is a drawing showing the embodiment of EPG converting processor in the present invention

6 Fig. 5a is a drawing showing the embodiment of the digital video broadcast service system relating to Y-matching with the processing of an image and voice and additional information and mobile radio communications network in the present invention

7 Fig. 5b is a drawing showing the embodiment of the analog broadcasting service system relating to Y-matching with the processing of an image and voice and additional information and mobile radio communications network in the present invention

8 Fig. 6 is a drawing showing the embodiment of the transcoder in the present invention

9 Fig. 7 is a drawing showing the embodiment of the mobile communications terminal of the present invention

10 Fig. 8 is a drawing showing the control sequence of the broadcast service in the present invention

Details of the Invention

Purpose of the Invention

The Technical Field to which the Invention Belongs and the Prior Art in that Filed

11 The present invention relates to the broadcasting service system which is the broadcasting service system using the mobile radio communications network, and watches the digital or the analog television (TV) broadcast by using the mobile radio communications network and communications terminal based on the cellular phone or PCS, CDMA of the IMT-2000 mode, and the mobile radio communications network like CDMA-2000.

12 The communications environment of a future and present changes suddenly as much as it transcends the division of the division of territory of the wire and wireless or the region or the country. And the future communications environment classified into the IMT-2000 A etc. is the trend constructed to the environment which and comprehensively provides the various information which a user as well as an image and voice need on a real time basis.

13 Moreover, the developmemt of the personal communications system is contrary to the dimension which just performs in the cellular phone or PCS etc. only the voice communications and it reaches even the extent the developmemt of the personal communications system wirelessly connects to an internet by using the personal communications system and of acquiring various information as well as the electrical transmission of the character information.

14 Moreover, a series of research and the performance for maximizing the advantage which the digital information one step further has upon a prior in the dimension which just transmits only the image (voice) the digital television system which processes the moving picture to digital data and which transmits on a real time basis and which receives and, this thing and displayed are visually shown.

15 Particularly, the video signal is compressed and is processed to digital data. The high speed , and the research for the realtime transmission of the high definition the performance already shows this thing with the faster speed as the more abundant amount content. And a commercialization is expected to be made in the suitable level and it is expected to be made. And a transmission and reception of this digital animation information come including the satellite broadcasting to the step provided to the terrestrial broadcasting system (sometimes, the cable broadcasting system).

16 But through the reciprocity organic combination which respects the advantage of both sides to do with respective optimization, the organic link is not made. And the digital television system of a past and conventional personal communications system yet does not deviate from the step of the voice communications and electrical transmission of the character information in case of its own inherent subordinate function, that is, the digital television system in case of the personal communications system including the consequence (the electrical transmission of PC through the internet network attains according to the case), which confines various additional information to the digital television receiver and which the digital television system of a past and conventional personal communications system provides with the image of the high definition the cellular phone or PCS etc.

Technical challenges of the Invention

17 The present invention is to provide the broadcasting service system in which a subscriber watches the broadcast signal transmitted through the mobile radio communications network a subscriber uses its own terminal it transmits the transformed broadcast signal through the mobile radio communications network it converts the digital or the analog broadcasting signal into the format which is suitable for the transmission standard of the mobile radio communications network on a real time basis and which uses the mobile radio communications network.

18 Moreover, the present invention is to provide the broadcasting service system which watches the telecasting of the corresponding channel it controls it receives the digital or the analog broadcasting signal of the channel which a user chooses by the corresponding subscriber terminal from the broadcast information through the mobile radio communications network it provides the broadcast information in response to the demand through the mobile radio communications network it

recognizes clearly this thing the mobile communications network subscriber requests the watching TV using the mobile radio communications network.

19 Moreover, the present invention is to provide the subscriber terminal of the broadcasting service system in which the mobile communications network subscriber watches the digital or the analog television broadcasting it uses the terminal it includes the means outputting to moreover, an image and voice it restores it receives the broadcast signal which a user selects with this means it adds the means selecting the broadcast signal to the terminal of the mobile communications network subscriber using the mobile radio communications network.

‣ Structure & Operation of the Invention

20 It is characterized that the broadcasting service system using the mobile communications of the present invention does an image and the speech signal provided from the moving picture resources to an input. The broadcasting service system using the mobile communications of the present invention is made including the means, converting this image and speech signal into the form which is suitable for a signal and transmission standard of the mobile radio communications network and the broadcasting service system using the mobile communications of the present invention is suitable for the mobile radio communications network, transformed image and the means transmitting the speech signal through the predetermined transmission line (channel) of the mobile radio communications network to a subscriber.

21 In the present invention, it is the analog television broadcasting signal, or the moving picture resources can be the digital television broadcast signal.

22 The present invention is characterized that an image and voice resource follow the first signal standard which is suitable for a telecasting. And the an image and voice resource are suitable for the mobile radio communications network, transformed digital image and the voice resource follow the second signal standard. And the first signal standard and the second signal standard follow the signal standard in which a conversion is possible between the different systems.

23 The present invention is characterized that an image and voice resource follow the first signal format which is suitable for the digital data electrical transmission. And the an image and voice resource are suitable for the mobile radio communications network, transformed digital image and the voice resource follow the second signal format. And the first signal format and the second signal format follow the signal standard in which a conversion is possible between the different systems.

24 The present invention is characterized that an image and voice resource follow the third signal format which is suitable for the analog television broadcasting. And it is made from the signal format of this third including the means converted into the second signal format.

25 In the present invention, the first signal format follows MPEG2. And the second signal format can follow the MPEG4, H.26L, H.263, H.26X. The third signal format can follow the analog television broadcasting signal format.

26 The present invention is characterized that the means converting the digital image and voice resource into the form which is suitable for the mobile radio communications network is suitable for the mobile radio communications network electrical transmission, it formats the digital image and audio data which is suitable for the digital television broadcasting system, is coded at least and the means converting the digital image and voice resource into the form which is suitable for the mobile radio communications network includes the means and for coding the thing, and the means. The means converts and controls the transfer rate in order to be suitable for the transfer rate of the mobile radio communications network.

27 The present invention is characterized that the means converting the digital image and voice resource into the form which is suitable for the mobile radio communications network is suitable for the analog television broadcasting system, the means converting the digital image and voice resource into the form which is suitable for the mobile radio communications network includes the formatted analog video image and the means converting the speech signal into the digital signal, the image transformed to this digital signal and the means it is suitable for the mobile radio communications network electrical transmission, for formating the speech signal and coding and, the thing, and the means at least. The means converts and controls the transfer rate in order to be suitable for the transfer rate of the mobile radio communications network.

28 Moreover, the present invention is characterized that is at least formatted above statement and the television image and the means transmitting the speech signal through the predetermined transmission line of the mobile radio communications network to a subscriber include the digital image, and the means transformed to the form which is suitable for the mobile radio communications network. As to the digital image, the transfer rate is controlled and the means for bringing audio data to the transmission line. The means together formats the telecasting information added in the digital image and audio data and transmits.

29 The present invention is characterized that EPG (Electronic Program Guide) data is together formated as the telecasting information added in the digital image and audio.data and it brings to the mobile radio communications network.

30 Moreover, the present invention is characterized that the means converting the television image and speech signal in the mobile radio communications network and transmits transmits through the telecommunication line of the wireless connected between the mobile communications subscriber and base station at least to the corresponding subscriber.

31 Moreover, the present invention is characterized that it assigns one or more line of the mobile radio communications network at least and the means converting the television image and speech signal in the mobile radio communications network and transmits transmits the television image and speech signal through the allocated private wire.

32 Moreover, the television system using the mobile communications of the present invention is characterized that the means, for distinguishing the subscriber provided the television image and speech signal among the mobile communications subscriber and the means charging the charge corresponding to an image and aural reception of the identified specific subscriber are more included.

33 Moreover, the mobile communications terminal including the television system using mobile communications of the present invention, the digital image provided through the mobile radio communications network and the means receiving audio data, the means decoding the received digital image as described above and audio data, the means outputting the decoded image as described above and speech signal, the means receiving EPG data as the additional information of audio data and received digital image as described above and reads and outputs, the means controlling the reception of audio data and digital image in response to the demand of the mobile communications subscriber corresponding to EPG data, and the means for inputting the response of the mobile communications subscriber corresponding to EPG data to the control means is provided.

34 Moreover, the broadcasting service system using the mobile radio communications network made of present invention, the process of transmitting EPG data with the response about this thing through the mobile radio communications network to a subscriber in case the mobile communications network subscriber demands the broadcast service, the process of selecting the channel searching the transmitted EPG data as described above and desires a watching, and the process of receiving the selected channel information as described above by a server and loading the predetermined allocated mobile radio communications network channel with the voice and image data of the corresponding channel and transmitting is provided.

35 In the present invention, the mobile communications terminal can be one among the cellular phone, the PCS terminal, or the IMT-2000 terminal.

36 A below, referring to the figure, the configuration according to a preferred embodiment of the present invention and the attached action are illustrated. And the configuration of the present invention and the action of being illustrated in the drawing and and, according to this, being explained are explained as one or more embodiment. And the above-described technical mapping of the present invention, according to this, the core configuration and action are not limited.

37 Therefore, the present invention will be more facilitated and it will be effectually,effectively transformable by the person engaged in the technical field about the element of the television system using the present invention mobile communications which illustrates in front of.

38 Firstly,
Fig. 1 schematically shows the system configuration of the television system using the mobile communications of the present invention.

39 The system of
Fig. 1 shows an example in which the present invention is applied to the cellular network.

40 The television broadcasing system (101) transmits an image and speech signal to the subscriber terminal (104) through the network of satellites (102), the ground wave broadcast network (103), or the wired network (Cable). By receiving this thing and appropriately decoding the subscriber terminal (104) outputs to the voice and image.

41 Here, the television broadcasing system (101) can be the analog television broadcasting system as the moving picture (and, the voice) resources. It can be the digital television broadcasting system. And it can be the other moving picture resources in other words.

42 The broadcast mode including NTSC, PAL, SECAM etc. is suggested and it is commercialized here the Japanese adopt the MPEG 2 (the image compression), the Dolby audio coding 3 (voice compression), and 8 VSB (transmission standard) in case of ATSC. And the Japanese adopt the DVB mode of Europe is MPEG 2 (an image and voice compression), and the OFDM (transmission mode). In case of the Republic of Korea, the terrestrial broadcasting and, the satellite broadcasting adopts the DVB mode the ATSC mode as the respective standard.

43 In the digital television broadcasting system as in the above, the digital video broadcast information of format satisfying this enforcement the proper enforcement related to a transceiving is defined an image and speech signal are provided in the form of the compression digital data (bit stream) maintains the system in which various additional information are together processed including EPG data as well as an image and audio data.

44 In the embodiment of the
Fig. 1 of the present invention, for example, the case of processing is illustrated for the digital video signal compacted to MPEG2 of one.

45 The television broadcasing system (101) is the digital television broadcasting system. If it is the case, the format convertor (105) which converts this thing into MPEG4 as the image size which is suitable for the mobile radio communications network since the image source which here is provided is the resources which is compression coded by the standard of MPEG2 is equipped.

46 The television broadcasing system (101) is the analog television broadcasting system. If it is the case, because of the image source which here is provided being converted into the digital signal and transmitting in and, the mobile radio communications network, the television broadcasing system (101) has the means converted into the suitable predetermined format, or the format convertor (105) which will be described later can have in other words (moving picture resources supplier).

47 In case of the electronics, it receives the MPEG2 image source provided from the television broadcasing system (101) with the input (106) and the format convertor (105) performs the task format-transformed to the MPEG4 which is suitable for the mobile radio communications network.

48 In case of a latter, referring to
Fig. 5b, it describes later.

49 In case of the electronics, the format convertor (105) can convert the MEPG2 image source into the format of H.26L, or H.263, or H.26X.

50 As to this thing, with being acceptable if it selects to be suitable for the network character of the mobile radio communications network and it performs it is not limited within this format.

51 The format convertor (105) exchanges necessary various information by the television broadcasing system (101) through the line (107) in the format conversion.

52 Concretely it looks into than the format convertor (105).

53 For example, the bit transfer rate (Bit Rate) used in the digital television uses the high speed broadcast band as approximately, the SD class of the HD class, of 19.236Mbps or 6Mbps.

54 But as to data rate of IMT-2000, according to the cell, since continuing with the maximum 2 Mbps (it is the Pico Cell) or 144kbps, it is the bidirectional signal processing of the maximum 2Mbps impossible to as to the intended mobile radio communications network, to like that deliver the digital television signal to the cellular phone (in other words, PCS) due to the network character of being different.

55 Therefore, the task format-transforming to the digital television signal of MPEG2 in the signal which is suitable for the mobile radio communications network including MPEG4 etc. is required. And the format convertor (105) manages the transcoding of audio data and image in this way. In order to the program guide information (EPG information) and other additional information together format among moreover, the digital television information and a signal and the standard which is suitable for the mobile radio communications network are followed it converts.

56 In this way, the transformed digital image, audio data and information are provided to MTSO (108: System Controller and Switch) through the line (109) in order to transmit with the mobile radio communications network. The MTSO (108) supplies the signal for responding to a demand from a subscriber to the format convertor (105) through the line (110). And it assigns moreover, the digital image and voice information to the fixed channel of the mobile radio communications network and it transmits to the subscriber terminal (112) as the radio frequency signal via the base station (111).

57 In this way, provided are the environment which converts an image and speech signal of the television broadcasing system (101) into a signal and the standard which is suitable for the mobile radio communications network and it loads to the mobile radio communications network and it provides to the subscriber terminal (112), and in that way can watch a telecasting to mobile communications terminal (the cellular phone or PCS, and the IMT-2000 terminal).

58 Fig. 2 is an embodiment more concretely, showing television system using the mobile communications of Fig. 1 illustrated in front of. Particularly, the format convertor (105) and MTSO (108) are an example of the system construction including the base station (111).

59 As to the television receiving part (201), in case the moving picture resources is the digital television broadcasting system, it receives the additional information including the digital image, corresponding to the digital television broadcasting system audio data and EPG from this thing and it transmits the MPEG2 signal in the transcoder (202). It extracts moreover, EPG data and it transmits in EPG transform unit (203). It extracts moreover, additional data and the part transmits in data converter (204).

60 The transcoder (202) converts the MPEG2 digital image and inputted audio data into the MPEG4 digital image and audio data and it transmits in the channel multiplexer (205).

61 That is, the bit rate or the modulation method of the digital image etc. need to be adaptively fitted with the characteristic of a media with the inconsistency of the transmission characteristics between a media and a media and a bandwidth with the during transfer while the transmission media of digital image data is varied. It is the system which especially, the present invention provides the signal of the digital television broadcasting system through the mobile radio communications network to the subscriber terminal of mobile communications including the cellular phone or PCS etc. Therefore, a transcoding is applied to the method for changing the already compacted bit string into the other bit string in order to transmit digital image

data through the media having the in this way different bandwidth.

62 And EPG transform unit (203) decodes inputted EPG data at the MPEG2 standard and it interprets this thing and it converts into EPG data format corresponding to MPEG4.

63 And the part data converter (204) decodes inputted additional data at the MPEG2 standard. This thing is interpreted and the part converts into the addition data format corresponding to MPEG4.

64 In front of, data transform converts into the format which is suitable for the wireless inernet and EPG conversion and part can transmit.

65 The channel multiplexer (205) brings the MPEG-4 video and audio data provided from the transcoder (202) to the predetermined allocated channel of the mobile radio communications network. EPG data and additional datas in which the part is outputted in data converter (204) bring to the predetermined allocated channel. At the same time outputted in EPG transform unit (203).

66 It is transformed to the MPEG4 standard after this kind of data process step and additional information including the format-transformed digitized television picture, the speech signal and EPG information are transmitted to the subscriber terminal according to and, the network character of the mobile radio communications network through the RF transmitter (206).

67 Here, through MTSO at the mobile radio communications network, the RF transmitter can be opposed to the base station.

68 In case of MPEG2, in case of being the SD class the band of 6Mbps is demanded and the case of being the HD class demands the band of about 19Mbps. In case of converting this thing into MPEG4 a part among the band of IMT-2000 is allocated to the bit rate of about 64kbps to the telecasting band and it transmits.

69 In the meantime, moving picture information are transmitted with a packet in order to transmit moving picture information to the broadcast channel (telecommunication line) of an exclusive. In that case, when the characteristic of the mobile radio communications network is considered, the band which the voice occupies in one base station according to the amount of currency of a subscriber is variable. The technique which changeably controls a bandwidth-on-demand since altogether occupying the telecasting information in the band which in this case, is restricted is required.

70 The moving picture (an inclusion including the voice etc) band for the digital television broadcasting is translated as the BW video. When the band for the voice communications of the mobile communications terminal is translated as the BW audio, the size of the voice band occupies according to the voice traffic in 0 to the maximum BW audio.

71 Therefore, according to the voice traffic, the channel multiplexer (205) provides the voice traffic information to the transmission rate control part (207). The transmission rate control part (207) controls the encoding rate of the MPEG4 of the transcoder (202) by using this information.

72 And as described above, not only an image and voice but also the additional information can be served at the digital television broadcasting in front of. Therefore, this additional information is provided to a subscriber through the addition data converter (204) and channel multiplexer (205).

73 Fig. 3 is a drawing showing the internal configuration of the format convertor illustrated in front of. Particularly, the configuration of the format conversion system including a transcoder, EPG data converter and data service converting processor is shown.

74 That is, the signal, the image provided from the television broadcasing system and A / V stream transcoder (304), EPG converting processor (305), and data service converting processor (306) are included. The signal is the signal inputted from the television broadcasing system (301) suitable for the mobile radio communications network (303) and the format convertor

(302) for converting into a standard. As to the image provided from the television, the voice stream (A/V Stream) is input and converted into the format which is suitable for the mobile radio communications network. As to EPG, EPG stream provided from the television broadcasing system is input and converted into the format which is suitable for the mobile radio communications network. As to data service, data stream provided from the television broadcasing system is input and converting this thing into the format which is suitable for the mobile radio communications network.

75 It converts into MPEG4, or H.26L, H.263, and the format of H.26X and in case of the digital image (inclusion of voice) resources of the MPEG2 which A / V stream transcoder (304) is inputted from the television broadcasing system, it provides to the mobile radio communications network (303).

76 At this time, the format-transformed digital image data as described above can be provided in response to the subscriber demand (A/V RQ) of the mobile radio communications network (303).

77 EPG converting processor (305) converted into the signal format which was suitable for the mobile radio communications network illustrating EPG stream of the MPEG2 inputted from the television broadcasing system in front of. And it showed the detailed operation example composition of EPG converting processor (305) in Fig. 4.

78 The processing procedure of EPG converting processor (305) has the information inputted from EPG information, that is, the PSIP table as an input and it performs the format decoding. It filters the necessary information including the program name or the bit transfer rate etc. and it extracts the necessary information from this thing. And it performs a series of process of comprising in order to do the extracted information with the format conversion (Contents Format Conversion) and it is satisfied the wireless data protocol.

79 Here, the format conversion converts the PSIP text into the HDML (Handheld Device Mark-up Language) or the TTML (Tagged Text Mark-up Language) in case of the wireless application protocol for example. And it converts into the HDTP (Handheld Device Transport Protocol) or the ITTP (Intelligent Terminal Transfer Protocol) in case of the wireless data protocol in case of PSIP.

80 As shown in Fig. 4, it has EPG analysis section (401), EPG response controller (402), the schedule database (403) and protocol converter (404). And it analyzes inputted EPG stream according to the encoded format and EPG analysis section (401) extracts the schedule related information of the broadcasting programs and channel related information. The result is stored in the schedule database (403).

81 The schedule database (403) records and stores the information inputted to EPG analysis section (401) in the memory. It searches the specific information within a database in response to a demand from EPG response controller (402) and it outputs.

82 EPG response controller (402) operates in response to EPG acknowledge request (EPG RQ) from the user through MTSO. And it searches the content coming under the demand of a user among the content of the schedule database (403) and it transmits this thing with the protocol converter (404).

83 In EPG response controller (402), the protocol converter (404) converts input data into the format canning be recognized in MTSO and it outputs. In that way a subscriber receives EPG information of the digital television broadcasting system to the mobile communications terminal. It corresponds with and, the subscriber response.

84 In the meantime, in Fig. 3, the additional information (Data Stream) inputted from the television broadcasing system (301) is input and data service converting processor (306) converts this thing into the format which is suitable for the mobile radio communications network. The corresponding information is provided in response to and, the subscriber demand (Data RQ) through the MTSO (303).

85 That is, data processing and conversion of data service converting processor (306) perform the process of converting the bit transfer rate and protocol the contents of the broadcasting data standard of the digital television and broadcast protocol in order to be suitable for the mobile radio communications network.

86 For example, it decodes by using the presentation engine including the MHEG-5 engine or the XHTML browser etc. about the service information of the digital television broadcasting system. The contents format conversion and protocol conversion are performed about the decoded information and a signal and the format which is suitable for the mobile radio communications network are followed.

87 Here, HDML is followed in case of the Carousel / IP Datagram to HDTP in case of the MHEG / XHTML in case of converting into the wireless internet WAP.

88 Fig. 5a is an embodiment implementing the digital television system using the mobile communications illustrating in front of. Fig. 5b is an embodiment implementing the analog television system using the mobile communication.

89 Firstly, it illustrates in the drawing 5a from the digital television broadcasting system which it shows and which uses the mobile communication.

90 The digital television broadcasting system using the mobile communications is made of the digital signal processing (501) and media storage (502), and data processing / transform unit (503) and transcoder / transmit unit (504).

91 The digital signal processing (501) plays 19.2Mbps HD class and the volunteering program transmit unit role for receiving 6Mbps SD class multichannel digital television signal and supplying the broadcasting program to the mobile radio communications network.

92 The digital signal processing (501) selects the inputted digital television signal in the tuner (505) than. After it demodulates the signal which here is selected in the demodeulator (506), it extracts the information from the demultiplexer (507) in each broadcasting channel. It reproduces with the MEPG decoder (507) as the digital television original broadcast signal and the voice and video signal output.

93 Here, data extracts data for the PSI (Program System Information) and guide information and addtional information providing regardless of a format with the MPEG TP demultiplexer (507).

94 The media storage (502) is made of the MPEG recorder (502a), the MPEG file input-output part (502b) and file filter (502c). It directly stores the disk scheduling for the same time storing the maximum 30Mbps class MPEG2 stream the digital television broadcast signal according to a need on a real time basis and the file system, which is the disc data block size designed according to the MPEG2 stream moreover, the stream like MPEG4 and it serves in the mobile radio communications network.

95 Here, in order to store the MPEG2 transport stream delivered from the digital television broadcasting signal receive part to the successive block-coded, the striping technique is used. And the GOP unit, and the I- frame vlaue can be directly supported in the file system so that the transcoder (513) efficiently compute the bit rate drop and macro block, the intra / inter (Intra/Inter) compensation etc.

96 The data processing / transform unit (512) is made of EPG decoder (509) and data decoder (510), presentation engine part (511), and protocol conversion (512). And it is EPG information which as described above, it receives by the digital television broadcasting in front of and the module which extracts the necessary information so that the mobile communications terminal user use datas which receive and converts into the additional information.

97 EPG decoder (509) extracts EPG data among data inputted from the digital signal processing (501) and it decodes. It is format-transformed in the presentation engine part (511) the contents and this thing is inputted to the protocol conversion

(512).

98 Here, as described above, the format conversion converts the PSIP text into HDML, and TTML in case of the wireless application protocol in front of. And it converts into HDTP, and ITTP in case of the wireless data protocol in case of PSIP.

99 The data decoder (510) extracts the additive service information among data inputted from the digital signal processing (501) and it decodes. It is format-transformed in the presentation engine part (511) the contents and this thing is inputted to the protocol conversion (512).

100 Here, HDML is followed in case of the Carousel / IP Datagram to HDTP in case of the MHEG / XHTML in case of converting into the wireless internet WAP.

101 The protocol conversion (512) converts additional information including the protocol conversion (512) is suitable for the mobile radio communications network, format-transformed EPG data into the protocol which is suitable for the mobile radio communications network and it outputs.

102 The transcoder (513) converts the digital image (inclusion of voice) signal inputted from the digital signal processing (501) of the broadcasting standard into the standard which is suitable for the mobile radio communications network. It can convert for example, MPEG2 into MPEG4. It receives the transmission rate control of the transmission rate control part (516) by the digital image and transformed audio data and it supplies the wireless data stream proccessing part (517).

103 The analog television broadcasting system which it shows and which uses the mobile communications is illustrated in the drawing 5b.

104 The analog television broadcasting system using the mobile communications is made of the analog signal processor (518) and media storage (502), and data processing / transform unit (503) and transcoder / transmit unit (504).

105 The media storage (502) and data processing / transform unit (503), and the transcoder / transmit unit (504) are identical with the drawing 5a.

106 The analog signal processor (518) is made of the analog broadcasting signal receiving part (519) and analogue-digital converter (520), MPEG4 encoder (521), and VBI extracting unit (522).

107 The analog signal processor (518) plays the volunteering program transmit unit role for receiving the analog television signal and supplying the broadcasting program to the mobile radio communications network.

108 The analog signal processor (518) receives the inputted analog television signal by the receiver (519) and it restores. It converts analog broadcasting signal (including the moving picture and voice information) which here are restored into digital data in the analogue-digital converter (520) and it converts the MEPG4 encoder (the encoder of H series) into the MPEG4 format and it provides to a transcoder and transmit unit (504). And it extracts EPG data and the additional data field loaded to the VBI section from the VBI extracting unit (522) and it provides to the respective EPG decoder (509) and additional data decoder (510).

109 Since being the same as that of the drawing 5a which the process of signal of the next illustrates in a before, it omits.

110 In this way, the broadcast service which used the mobile communications even by confronting in case the moving picture resources was the analog television broadcasting signal was possible.

111 One example of the transcoder (513) was shown in
Fig. 6.

112 The circuit of
Fig. 6 is the example of the case of converting MPEG2 into MPEG4. And according to this, the present invention is not limited.

113 That is, as shown in it exemplifies in front of, the digital image, which is suitable for the mobile radio communications network a circuit and the algorithm configuration of converting into such format if the voice data format is called H.26L, H.263, and H.26X will be possible.

114 Off-taste, as described above, in order to transmit the TV broadcasting signal by using the wireless network on a real time basis, it has to fit with the characteristic of the wireless network. A transcoding has to be performed for this thing between the different systems. In this case, in order to prevent the deterioration of the picture quality, it selects to proper and it can use among the transcoding method for being already widely studied.

115 Moreover, even by confronting in case of transmitting the digital television broadcasting resources by directly using the digital compression algorithm of MPEG4 or the H.263 series without the need to pass through a transcoding, it will be possible.

116 In the circuit of
Fig. 6, it has the MPEG 2bit stream as an input and it is done by the basis that the encoder (602) encodes reconstitution digital image data which the decoding unit (601) decodes to the bit stream of MPEG4 and it has.

117 Image data decoded in the variable-length code decoder (VLD) (603) of the decoding unit (601) becomes through the inverse quantizer (604) and reverse DCT part (605) with the inverse quantization and IDCT conversion. This thing is completely decoded into the original image after the motion compensation process of the output terminal consisting of the adder (606), the memory (607) and motion compensation (608) etc.

118 In this way, in the encoder (602) about restored digital image data, by encoding to the quantization step in a decoding and the other quantization step (in the present invention, the quantization step of an encoder is done than the quantization step of a decoder since converting MPEG2 into MPEG4) digital compressed video image data coded to MPEG4 is outputted.

119 In the DCT part (610) about the difference of the input image outputted after the adder (609) and reconstructed image, the encoder (602) performs the discrete cosine transform. It outputs the MPEG4 bit stream encoded through (612) to perform a quantization in the quantization unit (611) and encode with variable field. After it restores data already as is well known outputted in the quantization unit (611) after the inverse quantizer (613) and reverse DCT part (614), by performing a series of process of obtaining a difference with adder (609) input image data about this reconstructed image after the adder (615), the memory (616) and motion compensation process of the motion compensation (617) and again performing DCT of the thing and quantizing it compresses digital image data.

120 In this way, in the drawing 5a,5b, transcoded data is inputted to the transmission rate control part (516). It is adaptively controlled in terms of the transfer rate which is suitable for the environment of the mobile radio communications network and transcoded data is inputted to the wireless network stream proccessing part (517).

121 In the meantime, in the wireless network data protocol processing portion (515), data protocol canning be processed is named about EPG data and additional data outputted in the protocol conversion (512) of data processing / transform unit (503) illustrated in the mobile radio communications network in front of. Here HDTP, and ITTP correspond to for example, WAP.

122 Moreover, when keyword (the program name, and the performer`s name ***) in which the mobile communications terminal specified being reported and had been request the search about the corresponding air-time, the skill of being the corresponding program schedule, a summarization etc. at the database of the presentation engine part (511) in order to have easily the navigation is taken charge of.

123 And the media synchronizer (514) reconstructs the motive between data transformed in image data and data processing / transform unit (503) and the voice coded with the transcoder (513) with trans or it directly supplies about data in which the motive is unnecessary to the wireless stream proccessing part (517).

124 That is, the role of re-synchronizing is performed in the voice and image data which is most the synchronization information which loses the contents for data broadcasting synchronized to the voice and image data while passing through the transcoder (513) near.

125 In front of, as described above, the signal, the digital image and the voice, the additional information etc. re-organized to a format are inputted to the wireless stream proccessing part (517) is suitable for the mobile radio communications network.

126 At the same time, the wireless stream proccessing part (517) transmits the moving picture and data transmitted in the mobile radio communications network in the corresponding channel on a real time basis. And it performs an allocation and cancel release of the channel related to the digital television signal transmission as the response about the subscriber demand and that etc.

127 Fig. 7 is a television system using the mobile communications of the present invention. The operation example composition of the subscriber terminal receiving the television signal transmitted through the mobile radio communications network is shown.

128 The base station and two-way radio communications are performed through the antenna (701).

129 The RF transmitter- receiver (702) receives the TV broadcasting signal which has been being transmitted to the target call channel with the transceiving of the signal for the base station interrogation signal received through an antenna or the voice communication.

130 In case a vocoding and decoder (703) perform the voice communication, it decodes the counter voice signal received through the RF transmitter- receiver (702) and it supplies to the voice processor (706) and it is outputted through the speaker (SP). It encodes the speech signal inputted through the microphone (MIC) of a user from the voice processor (706) and it transmits through the RF transmitter- receiver (702).

131 The video encoding and decoder (704) performed the function of the MPEG4 decoder. And in the present preferred embodiment, in order to transcode to MPEG4 and reproduce image data transmitted through the mobile radio communications network, the MPEG4 decoder was comprised. But it can comprise according to the environment of the mobile radio communications network with the H.263 codec in case of being IMT-2000.

132 That is, according to the different kinds coded system processing the moving picture resources as the format which is suitable for the mobile radio communications network, it can comprise with the codec presented in front of corresponding to the thing of the different kinds encoding standard.

133 The video encoding and decoder (704) receive the MPEG4 digital video signal inputted from the RF transmitter- receiver (702) in the television broadcasting reception and it decodes. The restored television image signal outputs through the video color deflection (707) to the monitor (708).

134 As to the camera (705), it is to transmit the signal which takes a picture of the image of a user in case of being the mobile communications systems supporting the double-way image communications function through the video color deflection (707), the video encoding and decoder (704), and the RF transmitter- receiver (702).

135 The processor (709) appropriately controls each element with the voice mode and television receive mode in each mode. And it has been reading on the memory unit (710) or it stores necessary informations.

136 And the key input unit (711) is allocated the key promised for the television receive with the key input function for the telephone call.

137 Fig. 8 shows a series of procedure in which the broadcast signal is received between the broadcasting service system using the mobile communications of the present invention illustrated in the terminal of Fig. 7 and front.

138 The action of figs. 7 and figs. 7 EPG data is sent in response to the subscriber demand to a subscriber and the case of transmitting the signal format-transformed through the channel keeping with the corresponding subscriber is illustrated for the program in which a subscriber selects the EPG data as the basis as the embodiment.

139 And at this time, a charge is charged to a subscriber. With meaning to have the authority which receives the digital television broadcasting and which a subscriber can look and listen this thing assumes. And a subscriber has the promised telephone number processing such subscriber demand upon the mobile communications server (company) in advance. Also, with performing the reciprocity appointment of the password for an identification and authentication process it assumes.

140 Firstly, in case it desires that the members of mobile station receives the digital television broadcasting through the mobile radio communications network in which oneself joins, by using the key input unit (711), a subscriber sets up the TV mode. A subscriber connects to the specially promised telephone number with the server (mobile communications service provider). .(the telecommunication line demand).

141 By using the password in which a subscriber inputs whether or not of the subscriber validation having the authority in which a subscriber can receive the digital television broadcasting if a connection succeeds in, it verifies.

142 If it is the subscriber having the authority in which a subscriber can receive the digital television broadcast signal, an authentication is performed (Access Grant). The private wire (channel) watching the moving picture is assigned.

143 And MTSO demands EPG data to the format convertor.

144 The format convertor supplies EPG data packet to MTSO in response to EPG data demand. MTSO transmits EPG packet through the communications channel keeping with a subscriber to a subscriber.

145 Here, EPG packet data can have the mode which is transmitted to the format which is suitable for the wireless inernet and is received.

146 EPG data packet received to the antenna (701) is decoded in the video encoding and decoder (704) through the RF transmitter- receiver (702). The decoded result is indicated on the monitor (708) through the video color deflection (707).

147 A user selects the channel for to searching EPG data and watching in response to this thing.

148 So that a user select the channel for to searching EPG data and watching, the terminal (processor) has the web browser means. In order to search to not only EPG data but also the additional information by using this web browser means it supports.

149 The channel selection information desiring a watching is inputted through the key input unit (711) to the processor (709). It controls coding the corresponding signal and the processor (709) delivers to a server through the RF transmitter- receiver (702) and antenna (701).

150 The server (MTSO) asks the format convertor to the voice and image data corresponding to the channel in which a user desires a watching. It outputs the voice and image data corresponding to and the format convertor transmits through the mobile radio communications network to a subscriber.

151 In this way, the transmitted TV broadcasting signal is inputted through the antenna (701) and RF transmitter- receiver (702) to the video encoding and decoder (704). As described above, it functions as the MPEG4 decoder and the video encoding and decoder (704) decode the received broadcasting program as described above in front of. The transmitted TV broadcasting signal outputs an image and voice through each processing units (707,706) to the monitor (708) and speaker (SP). In that way the telecasting audition using the mobile radio communications network is accomplished.

152 In the meantime, in the Hoo in which the user authentication is made like the upper part, the user authentication password is in a server to ID and the charging about the broadcasting program which a user looks and listen can be performed.

153 In the meantime, here, it may be acceptable that it illustrated that the TV broadcasting signal was transmitted about the special channel (the variable channel) which was opened between a user and subscriber and was maintained. But as shown in it already mentions in front of, the television system using the mobile communications of the invention assigning the specific predetermined channel to the telecasting dragon is performed.

▸ Effects of the Invention

154 Provided is the environment in which the present invention can watch the moving picture by using the mobile radio communications network, and it has especially, the moving picture resources as the analog television broadcasting signal or the digital television broadcast signal a case, and yet, a user can watch each TV broadcasting signal by using the mobile communications terminal.

155 The present invention relates to the mobile communications terminal, and by using the cellular phone or PCS, and the IMT2000 terminal, the telecasting in which a subscriber wants can be watched for example.

156 Moreover, the present invention sends EPG data in response to the demand of a subscriber. It can provide the broadcasting program in which a subscriber desires a watching from this data on a real time basis.

Scope of Claims

Claim[1] :

157 The broadcasting service system using the mobile radio communications network wherein it is made including the image provided from the moving picture resources and the means converting the speech signal into the form which is suitable for a signal and transmission standard of the mobile radio communications network and the it is suitable for the mobile radio communications network, transformed image and the means transmitting the speech signal through the predetermined transmission line (channel) of the mobile radio communications network to a subscriber.

Claim[2] :

158 The broadcasting service system using the mobile radio communications network of claim 1, wherein an image and voice resource follow the first signal standard which is suitable for a telecasting; the an image and voice resource are suitable for the mobile radio communications network, transformed digital image and the voice resource follow the second signal standard; and the first signal standard and the second signal standard follow the signal standard in which a conversion is possible between the different systems.

Claim[3] :

159 The broadcasting service system using the mobile radio communications network of claim 2, wherein the first signal standard follows MPEG2; and the second signal standard follows MPEG4, H.26L, and the H.263. H.26X.

Claim[4] :

160 The broadcasting service system using the mobile radio communications network of claim 1, wherein the means converting an image and voice resource into the form which is suitable for the mobile radio communications network is suitable for the mobile radio communications network electrical transmission, it formats the digital image and audio data which is suitable for the digital television broadcasting system, is coded at least and it includes the means and for coding the thing, and the means, and the means converts and controls the transfer rate in order to be suitable for the transfer rate of the mobile radio communications network.

Claim[5] :

161 The broadcasting service system using the mobile radio communications network of claim 1, wherein the means converting an image and voice resource into the form which is suitable for the mobile radio communications network is suitable for the mobile radio communications network electrical transmission, it formats the broadcast signal including the means converting the analog television broadcasting signal into the digital signal at least, and the moving picture and the voice transformed to the digital signal and it includes the means and for coding the thing, and the means, and the means converts and controls the transfer rate in order to be suitable for the transfer rate of the mobile radio communications network.

Claim[6] :

162 The broadcasting service system using the mobile radio communications network of claim 1, wherein: the image transformed to the form which is suitable for the mobile radio communications network and the means transmitting the speech signal through the predetermined transmission line of the mobile radio communications network to a subscriber are at least formatted above statement and it includes the digital image, and the means; as to the digital image, the transfer rate is controlled and the means for bringing audio data to the transmission line; and the means together formats the broadcast information added in the digital image and audio data and transmits.

Claim[7] :

163 The broadcasting service system using the mobile radio communications network of claim 1, wherein EPG data is together formated as the telecasting information added in an image and speech signal and it brings to the mobile radio communications network.

Claim[8] :

164 The broadcasting service system using the mobile radio communications network of claim 1, wherein the means converting an image and speech signal in the mobile radio communications network and transmits transmits through the line connected between the mobile communications subscriber and base station at least to the corresponding subscriber.

Claim[9] :

165 The broadcasting service system using the mobile radio communications network of claim 1, wherein the means converting an image and speech signal in the mobile radio communications network and transmits assigns one or more line of the mobile radio communications network at least and it transmits an image and speech signal through the allocated private wire.

Claim[10] :

166 The broadcasting service system using the mobile radio communications network of claim 1, further comprising the means, for distinguishing the subscriber provided the television image and speech signal among the mobile communications subscriber as the telecasting service system using the mobile communications and the means charging the charge corresponding to an image and aural reception of the identified specific subscriber.

Claim[11] :

167 The mobile communications terminal wherein it is comprised of the digital image provided as the receiving means of the broadcasting service system using the mobile communications through the mobile radio communications network and the

means receiving audio data and the means, decoding the received digital image as described above and audio data and the means outputting the decoded image as described above and speech signal.

Claim[12] :

168 The mobile communications terminal of claim 11, further comprising the means, which it decodes it receives EPG signal by the broadcast signal transmitted through the mobile radio communications network and the means for transmitting the user search response of the decoded EPG data as described above to the service system.

Claim[13] :

169 The mobile communications terminal of claim 11, wherein the mobile communications terminal is one among the cellular phone, the PCS terminal, or the IMT-2000 terminal.

Claim[14] :

170 The mobile communications terminal of claim 11, further comprising EPG data transmitted through the mobile radio communications network and the web browser means for searching the additional information.

Claim[15] :

171 The broadcasting service system using the mobile radio communications network wherein it is made including the digital image inputted with the digital image and voice input means and the input means provided the digital image and speech signal as the digital broadcast signal from the supplier of the target resource and the means assigning the format which is suitable for the mobile radio communications network and the transcoding mean, which converts into the transfer rate and the format which is coded with the trans and is suitable for the mobile radio communications network and the digital broadcast signal transformed to the transfer rate to the fixed channel of the mobile radio communications network and loads the speech signal and transmits.

Claim[16] :

172 The broadcasting service system using the mobile radio communications network of claim 15, wherein the means, converting EPG data for selecting the digital broadcast channel into the format which is suitable for the mobile radio communications network and the means converting the information added in the digital video broadcast into the suitable format after the mobile communications are more included and it is made.

Claim[17] :

173 The broadcasting service system using the mobile radio communications network of claim 16, wherein EPG data and additional information transmit with the format which is suitable for the wireless inernet.

Claim[18] :

174 The broadcasting service system using the mobile radio communications network of claim 16, wherein: EPG stream of the digital video broadcast is input and it is made of the means, the means, the database means, the means outputting EPG information in response to the subscriber demand from a database, and the means; the means EPG converting mean decodes; the means interprets the decoded EPG data as described above and restored; the database means corresponding information based on the restored EPG data as described above are stored; and the means is suitable for the standard of the mobile radio communications network, converts the outputted EPG data as described above.

Claim[19] :

175 The broadcasting service system using the mobile radio communications network wherein it is made including the digital signal process means, for the digital broadcast signal being input and supplying the broadcasting program to the mobile radio communications network and the media storage means, which the broadcast information processed at the digital signal process means is stored and EPG data processed at the digital signal process means and data processing and the

converting mean converting the additional information into the signal format which is suitable for the mobile radio communications network and the voice processed at the digital signal process means and transcoder and the transmission method in which image data are input and which converts into the signal format which is suitable for the mobile radio communications network and outputted.

Claim[20] :

176 The broadcasting service system using the mobile radio communications network of claim 19, wherein the digital signal process means is comprised in the tuner, for selecting the digital broadcast signal which is inputted by using the transmission media including the aerial frequency broadcasting, the satellite broadcasting, the cable broadcast etc. and the demodulation method, for restoring the selected digital broadcast signal as described above and demodulated digital broadcast signal as described above including EPG information and the demultiplexer for drawing out the additional information and the decoder for decoding the voice and video signal in the demodulated digital broadcast signal as described above.

Claim[21] :

177 The broadcasting service system using the mobile radio communications network of claim 19, wherein data processing and converting mean are comprised of the means, decoding EPG data of the digital video broadcast and the means, converting decoded EPG data into the signal format which is suitable for the mobile radio communications network and the means, converting the transformed EPG data as described above into the protocol which is suitable for the mobile radio communications network and the means, decoding the additional information of the digital video broadcast and the means, converting the decoded additional information into the signal format which is suitable for the mobile radio communications network and the means converting the transformed additional information as described above into the protocol which is suitable for the mobile radio communications network.

Claim[22] :

178 The broadcasting service system using the mobile radio communications network of claim 19, wherein a transcoder and transmission method are suitable for the transcoder, converting an image and speech signal of the digital video broadcast into the format of the mobile radio communications network and the transmission rate control means, controlled to the transfer rate which is suitable for the environment of the mobile radio communications network about the transcoder output and the means, converting the output of the converting mean and data processing into the form which is suitable for data protocol of the mobile radio communications network and the means, in which the motive performs the synchronous processing about the necessary information in a transcoding and protocol conversion and mobile radio communications network, it assigns the format conversion and transmission rate control, and the protocol conversion and synchronized final datas to the fixed channel of the wireless network and it is comprised of the means transmitting on a real time basis.

Claim[23] :

179 The method for broadcasting service using the mobile radio communications network wherein it is made including the process, of converting the broadcast signal including the digital image and audio data into the form which is suitable for a signal and transmission standard of the mobile radio communications network and the it is suitable for the mobile radio communications network, transformed digital image and the process of transmitting audio data through the predetermined transmission line (channel) of the mobile radio communications network to a subscriber.

Claim[24] :

180 The method for broadcasting service using the mobile radio communications network of claim 23, wherein the format conversion process is performed to the step, that is suitable for a standard and transfer rate of the mobile radio communications network, converts an image and audio data of the digital broadcast signal and the step that is suitable for a standard and transfer rate of the mobile radio communications network, converts EPG data and additional information of the digital broadcast signal; and the transmission procedure is performed to the transformed digital image and the step performing the synchronization control of the element in which it is necessary to have the motive about audio data, EPG data and additional information and the step, that is punished with the synchronization control and converts datas according to the protocol of the mobile radio communications network and the step assigning the predetermined channel and brings digital datas following the protocol of the mobile radio communications network.

Claim[25] :

181 The method for broadcasting service using the mobile radio communications network wherein it is made of the process of transmitting EPG data with the response about this thing through the mobile radio communications network to a subscriber, the process of selecting the channel searching the transmitted EPG data as described above and desires a watching, the process of receiving the selected channel information as described above by a server and it is suitable for a signal and standard of the mobile radio communications network, converting the voice and image data of the corresponding channel, and the process of loading the predetermined allocated mobile radio communications network channel with the transformed datas as described above and transmitting in case the mobile communications network subscriber demands the broadcast service.

Claim[26] :

182 The method for broadcasting service using the mobile radio communications network of claim 25, wherein the authority watching the digital video broadcast is endowed the mobile communications subscriber with; and the procedure of verifying the validity of this authority and authenticating is completed and it progresses as the release step of EPG information.

Claim[27] :

183 The method for broadcasting service using the mobile radio communications network of claim 25 or 26, wherein ID is given to the mobile communications subscriber; and ID is recognized clearly and the digital video broadcast free for service about the corresponding subscriber is charged.

Claim[28] :

184 The broadcasting service system using the mobile radio communications network wherein the analog broadcasting receiving means, receiving the analog television broadcasting signal as the moving picture resources and the means, converting the broadcast signal received to the analog broadcasting receiving means into the digital signal and the signal which is the digital broadcast signal transformed with the analog digital transform means suitable for the mobile radio communications network and the encoding converting mean, converted into a standard and the digital broadcast signal transformed with the encoding converting mean are assigned to the predetermined line of the mobile radio communications network and it is made including the transmission method transmitted to a subscriber.

Claim[29] :

185 The broadcasting service system using the mobile radio communications network of claim 28, wherein the means, extracting EPG signal and additional information in the analog broadcasting receiving means among the received broadcast signal and extracted EPG signal as described above and additional information the signal which is suitable for the mobile radio communications network and the encoding converting mean converted into a standard are more included and EPG and additional information are transmitted with moving picture information to a subscriber.

Claim[30] :

186 The broadcasting service system using the mobile radio communications network of claim 28 or 29, wherein the encoding converting mean directly encodes the broadcast signal converted into a digital format the analog / to the format which is suitable for the mobile radio communications network transmission characteristics like the MPEG4, H.26L, H.263, H.26X and it brings to the transmission line.